Matthias LÃ¼tolf

List of Publications by Year
in descending order

111 papers	22,043 citations	23500 58 h-index	27345 106 g-index
124 all docs	124 docs citations	124 times ranked	22326 citing authors

#	Article	IF	Citations
1	Synthetic biomaterials as instructive extracellular microenvironments for morphogenesis in tissue engineering. Nature Biotechnology, 2005, 23, 47-55.	9.4	4,068
2	Synthetic matrix metalloproteinase-sensitive hydrogels for the conduction of tissue regeneration: Engineering cell-invasion characteristics. Proceedings of the National Academy of Sciences of the United States of America, 2003, 100, 5413-5418.	3.3	1,331
3	Designing materials to direct stem-cell fate. Nature, 2009, 462, 433-441.	13.7	1,276
4	Designer matrices for intestinal stem cell and organoid culture. Nature, 2016, 539, 560-564.	13.7	1,027
5	NAD ⁺ repletion improves mitochondrial and stem cell function and enhances life span in mice. Science, 2016, 352, 1436-1443.	6.0	907
6	Repair of bone defects using synthetic mimetics of collagenous extracellular matrices. Nature Biotechnology, 2003, 21, 513-518.	9.4	797
7	Progress and potential in organoid research. Nature Reviews Genetics, 2018, 19, 671-687.	7.7	693
8	Synthesis and Physicochemical Characterization of End-Linked Poly(ethylene glycol)-co-peptide Hydrogels Formed by Michael-Type Addition. Biomacromolecules, 2003, 4, 713-722.	2.6	639
9	Molecularly Engineered PEG Hydrogels: A Novel Model System for Proteolytically Mediated Cell Migration. Biophysical Journal, 2005, 89, 1374-1388.	0.2	509
10	Engineering organoids. Nature Reviews Materials, 2021, 6, 402-420.	23.3	497
11	Cell-Responsive Synthetic Hydrogels. Advanced Materials, 2003, 15, 888-892.	11.1	486
12	Homeostatic mini-intestines through scaffold-guided organoid morphogenesis. Nature, 2020, 585, 574-578.	13.7	408
13	Artificial niche microarrays for probing single stem cell fate in high throughput. Nature Methods, 2011, 8, 949-955.	9.0	376
14	Multi-axial self-organization properties of mouse embryonic stem cells into gastruloids. Nature, 2018, 562, 272-276.	13.7	347
15	Systematic Modulation of Michael-Type Reactivity of Thiols through the Use of Charged Amino Acids. Bioconjugate Chemistry, 2001, 12, 1051-1056.	1.8	334
16	The hope and the hype of organoid research. Development (Cambridge), 2017, 144, 938-941.	1.2	303
17	Elucidating the Role of Matrix Stiffness in 3D Cell Migration and Remodeling. Biophysical Journal, 2011, 100, 284-293.	0.2	291
18	In situ cell manipulation through enzymatic hydrogel photopatterning. Nature Materials, 2013, 12, 1072-1078.	13.3	282

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19	Recapitulating macro-scale tissue self-organization through organoid bioprinting. Nature Materials, 2021, 20, 22-29.	13.3	279
20	Biomolecular Hydrogels Formed and Degraded via Site-Specific Enzymatic Reactions. Biomacromolecules, 2007, 8, 3000-3007.	2.6	264
21	Artificial three-dimensional niches deconstruct pancreas development<i>in vitro</i>. Development (Cambridge), 2013, 140, 4452-4462.	1.2	233
22	Defined three-dimensional microenvironments boost induction of pluripotency. Nature Materials, 2016, 15, 344-352.	13.3	233
23	Microdrop Printing of Hydrogel Bioinks into 3D Tissueâ€Like Geometries. Advanced Materials, 2012, 24, 391-396.	11.1	231
24	High-throughput automated organoid culture via stem-cell aggregation in microcavity arrays. Nature Biomedical Engineering, 2020, 4, 863-874.	11.6	231
25	Engineering Stem Cell Self-organization to Build Better Organoids. Cell Stem Cell, 2019, 24, 860-876.	5.2	228
26	Spotlight on hydrogels. Nature Materials, 2009, 8, 451-453.	13.3	211
27	3D niche microarrays for systems-level analyses of cell fate. Nature Communications, 2014, 5, 4324.	5.8	210
28	Specification of haematopoietic stem cell fate via modulation of mitochondrial activity. Nature Communications, 2016, 7, 13125.	5.8	206
29	Enzymatic formation of modular cell-instructive fibrin analogs for tissue engineering. Biomaterials, 2007, 28, 3856-3866.	5.7	203
30	Artificial Stem Cell Niches. Advanced Materials, 2009, 21, 3255-3268.	11.1	203
31	The selective modulation of endothelial cell mobility on RGD peptide containing surfaces by YIGSR peptides. Biomaterials, 2005, 26, 167-174.	5.7	190
32	Neural tube morphogenesis in synthetic 3D microenvironments. Proceedings of the National Academy of Sciences of the United States of America, 2016, 113, E6831-E6839.	3.3	186
33	Tissue geometry drives deterministic organoid patterning. Science, 2022, 375, eaaw9021.	6.0	186
34	3D Reconstitution of the Patterned Neural Tube from Embryonic Stem Cells. Stem Cell Reports, 2014, 3, 987-999.	2.3	175
35	Drug discovery through stem cell-based organoid models. Advanced Drug Delivery Reviews, 2014, 69-70, 19-28.	6.6	172
36	Perturbation of single hematopoietic stem cell fates in artificial niches. Integrative Biology (United) Tj ETQq0 0 0 rgBT /Overlock 10 Tf 50	0.6	170

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37	Capturing Cardiogenesis in Gastruloids. Cell Stem Cell, 2021, 28, 230-240.e6.	5.2	167
38	Anteroposterior polarity and elongation in the absence of extraembryonic tissues and spatially localised signalling in <i>Gastruloids</i>, mammalian embryonic organoids. Development (Cambridge), 2017, 144, 3894-3906.	1.2	166
39	Next-generation cancer organoids. Nature Materials, 2022, 21, 143-159.	13.3	163
40	In Situ Patterning of Microfluidic Networks in 3D Cellâ€Laden Hydrogels. Advanced Materials, 2016, 28, 7450-7456.	11.1	145
41	Decoding of position in the developing neural tube from antiparallel morphogen gradients. Science, 2017, 356, 1379-1383.	6.0	144
42	The NAD-Booster Nicotinamide Riboside Potently Stimulates Hematopoiesis through Increased Mitochondrial Clearance. Cell Stem Cell, 2019, 24, 405-418.e7.	5.2	143
43	Building consensus on definition and nomenclature of hepatic, pancreatic, and biliary organoids. Cell Stem Cell, 2021, 28, 816-832.	5.2	133
44	Chronic inflammation imposes aberrant cell fate in regenerating epithelia through mechanotransduction. Nature Cell Biology, 2016, 18, 168-180.	4.6	127
45	3D extrusion bioprinting. Nature Reviews Methods Primers, 2021, 1, .	11.8	127
46	Engineered signaling centers for the spatially controlled patterning of human pluripotent stem cells. Nature Methods, 2019, 16, 640-648.	9.0	120
47	Bioengineering approaches to guide stem cell-based organogenesis. Development (Cambridge), 2014, 141, 1794-1804.	1.2	116
48	Mechano-modulatory synthetic niches for liver organoid derivation. Nature Communications, 2020, 11, 3416.	5.8	112
49	Synthetic dynamic hydrogels promote degradation-independent in vitro organogenesis. Nature Materials, 2022, 21, 479-487.	13.3	102
50	Synthesis and characterization of well-defined hydrogel matrices and their application to intestinal stem cell and organoid culture. Nature Protocols, 2017, 12, 2263-2274.	5.5	98
51	3D Inkjet Printing of Complex, Cell-Laden Hydrogel Structures. Scientific Reports, 2018, 8, 17099.	1.6	96
52	Hydrogel microfluidics for the patterning of pluripotent stem cells. Scientific Reports, 2014, 4, 4462.	1.6	87
53	Stem-cell-based embryo models for fundamental research and translation. Nature Materials, 2021, 20, 132-144.	13.3	86
54	The heparin binding domain of von Willebrand factor binds to growth factors and promotes angiogenesis in wound healing. Blood, 2019, 133, 2559-2569.	0.6	81

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55	Stem cell niche engineering through droplet microfluidics. Current Opinion in Biotechnology, 2015, 35, 86-93.	3.3	73
56	Hyaluronic Acid Hydrogels Formed in Situ by Transglutaminase-Catalyzed Reaction. Biomacromolecules, 2016, 17, 1553-1560.	2.6	72
57	Integration column: Artificial ECM: expanding the cell biology toolbox in 3D. Integrative Biology (United Kingdom), 2009, 1, 235.	0.6	70
58	Tailoring hydrogel degradation and drug release via neighboring amino acid controlled esterhydrolysis. Soft Matter, 2009, 5, 440-446.	1.2	66
59	Understanding the Mechanobiology of Early Mammalian Development through Bioengineered Models. Developmental Cell, 2019, 48, 751-763.	3.1	64
60	The Effect of Thiol Structure on Allyl Sulfide Photodegradable Hydrogels and their Application as a Degradable Scaffold for Organoid Passaging. Advanced Materials, 2020, 32, e1905366.	11.1	58
61	High-throughput approaches for the analysis of extrinsic regulators of stem cell fate. Current Opinion in Cell Biology, 2012, 24, 236-244.	2.6	54
62	Cell-Instructive Microgels with Tailor-Made Physicochemical Properties. Small, 2015, 11, 5647-5656.	5.2	54
63	Morphogenesis Guided by 3D Patterning of Growth Factors in Biological Matrices. Advanced Materials, 2020, 32, e1908299.	11.1	54
64	Bioinspired Hydrogels for 3D Organoid Culture. Chimia, 2019, 73, 81.	0.3	51
65	Gastruloids generated without exogenous Wnt activation develop anterior neural tissues. Stem Cell Reports, 2021, 16, 1143-1155.	2.3	46
66	Hydrogel-based milliwell arrays for standardized and scalable retinal organoid cultures. Scientific Reports, 2020, 10, 10275.	1.6	45
67	Extracellular matrix requirements for gastrointestinal organoid cultures. Biomaterials, 2021, 276, 121020.	5.7	41
68	Tissue-Engineering the Intestine: The Trials before the Trials. Cell Stem Cell, 2019, 24, 855-859.	5.2	39
69	Synthetic 3D PEG-Anisogel Tailored with Fibronectin Fragments Induce Aligned Nerve Extension. Biomacromolecules, 2019, 20, 4075-4087.	2.6	38
70	A Versatile Approach to Engineering Biomoleculeâ€Presenting Cellular Microenvironments. Advanced Healthcare Materials, 2013, 2, 292-296.	3.9	37
71	Bioengineered embryoids mimic post-implantation development in vitro. Nature Communications, 2021, 12, 5140.	5.8	35
72	Antiangiogenic immunotherapy suppresses desmoplastic and chemoresistant intestinal tumors in mice. Journal of Clinical Investigation, 2020, 130, 1199-1216.	3.9	35

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73	Single-cell analyses identify bioengineered niches for enhanced maintenance of hematopoietic stem cells. Nature Communications, 2017, 8, 221.	5.8	34
74	Brief Report: Single-Cell Analysis Reveals Cell Division-Independent Emergence of Megakaryocytes From Phenotypic Hematopoietic Stem Cells. Stem Cells, 2015, 33, 3152-3157.	1.4	33
75	Multiscale microenvironmental perturbation of pluripotent stem cell fate and self-organization. Scientific Reports, 2017, 7, 44711.	1.6	33
76	A functional genetic toolbox for human tissue-derived organoids. ELife, 2021, 10, .	2.8	33
77	Deterministic scRNA-seq captures variation in intestinal crypt and organoid composition. Nature Methods, 2022, 19, 323-330.	9.0	33
78	Robust Phase Unwrapping via Deep Image Prior for Quantitative Phase Imaging. IEEE Transactions on Image Processing, 2021, 30, 7025-7037.	6.0	30
79	Lowâ€Defect Thiolâ€Michael Addition Hydrogels as Matrigel Substitutes for Epithelial Organoid Derivation. Advanced Functional Materials, 2020, 30, 2000761.	7.8	28
80	Bioengineering inÂvitro models of embryonic development. Stem Cell Reports, 2021, 16, 1104-1116.	2.3	26
81	Pharmacological Induction of a Progenitor State for the Efficient Expansion of Primary Human Hepatocytes. Hepatology, 2019, 69, 2214-2231.	3.6	22
82	Labelâ€Free Quantification Proteomics for the Identification of Mesenchymal Stromal Cell Matrisome Inside 3D Poly(Ethylene Glycol) Hydrogels. Advanced Healthcare Materials, 2018, 7, e1800534.	3.9	21
83	Reconstitution of a Patterned Neural Tube from Single Mouse Embryonic Stem Cells. Methods in Molecular Biology, 2017, 1597, 43-55.	0.4	16
84	Identification of in vitro HSC fate regulators by differential lipid raft clustering. Cell Cycle, 2012, 11, 1535-1543.	1.3	13
85	Capturing Cellâ€"Cell Interactions via SNAP-tag and CLIP-tag Technology. Bioconjugate Chemistry, 2015, 26, 1678-1686.	1.8	13
86	Microfluidic Programming of Compositional Hydrogel Landscapes. Macromolecular Rapid Communications, 2017, 38, 1700255.	2.0	12
87	Machine Learning of Hematopoietic Stem Cell Divisions from Paired Daughter Cell Expression Profiles Reveals Effects of Aging on Self-Renewal. Cell Systems, 2020, 11, 640-652.e5.	2.9	12
88	Microarrayed human bone marrow organoids for modeling blood stem cell dynamics. APL Bioengineering, 2022, 6, .	3.3	12
89	Hydrogel Microwell Arrays Allow the Assessment of Protease-Associated Enhancement of Cancer Cell Aggregation and Survival. Microarrays (Basel, Switzerland), 2013, 2, 208-227.	1.4	11
90	Microfluidic Patterning of Protein Gradients on Biomimetic Hydrogel Substrates. Methods in Cell Biology, 2014, 121, 91-102.	0.5	11

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91	3D chemical characterization of frozen hydrated hydrogels using ToF-SIMS with argon cluster sputter depth profiling. Biointerphases, 2016, 11, 02A301.	0.6	11
92	A Single Metabolite which Modulates Lipid Metabolism Alters Hematopoietic Stem/Progenitor Cell Behavior and Promotes Lymphoid Reconstitution. Stem Cell Reports, 2020, 15, 566-576.	2.3	10
93	A generic strategy for pharmacological caging of growth factors for tissue engineering. Chemical Communications, 2013, 49, 5927.	2.2	8
94	High-throughput stem cell-based phenotypic screening through microniches. Biomaterials Science, 2019, 7, 3471-3479.	2.6	8
95	Artificial niche microarrays for identifying extrinsic cell-fate determinants. Methods in Cell Biology, 2018, 148, 51-69.	0.5	6
96	Developmental dynamics of the neural crestâ€“mesenchymal axis in creating the thymic microenvironment. Science Advances, 2022, 8, eabm9844.	4.7	6
97	An automated do-it-yourself system for dynamic stem cell and organoid culture in standard multi-well plates. Cell Reports Methods, 2022, 2, 100244.	1.4	6
98	Generation of Induced Pluripotent Stem Cells in Defined Three-Dimensional Hydrogels. Methods in Molecular Biology, 2017, 1612, 65-78.	0.4	4
99	Mammary epithelial morphogenesis in 3D combinatorial microenvironments. Scientific Reports, 2020, 10, 21635.	1.6	4
100	In Vivo Pre-Instructed HSCs Robustly Execute Asymmetric Cell Divisions In Vitro. International Journal of Molecular Sciences, 2020, 21, 8225.	1.8	4
101	An engineered multicellular stem cell niche for the 3D derivation of human myogenic progenitors from iPSCs. EMBO Journal, 0, , .	3.5	3
102	Stem cellâ€“materials interactions. Biomaterials Science, 2014, 2, 1545-1547.	2.6	2
103	Editorial overview: Tissue, cell and pathway engineering: The advent of complexity. Current Opinion in Biotechnology, 2017, 47, iv-vi.	3.3	2
104	Mammalian body plan engineering: Lessons and challenges. Current Opinion in Systems Biology, 2018, 11, 50-56.	1.3	2
105	Breaking the Barriers in Engineering Organoids and Tissues with Advanced Materials. Advanced Functional Materials, 2020, 30, 2008531.	7.8	2
106	PEG-based bioactive hydrogels crosslinked via phosphopantetheinyl transferase. Materials Research Society Symposia Proceedings, 2010, 1272, 1.	0.1	1
107	Biomaterials Approaches in Stem Cell Mechanobiology. Progress in Molecular Biology and Translational Science, 2014, 126, 257-278.	0.9	1
108	Synthetic Biomaterials as Cell-Responsive Artificial Extracellular Matrices. , 2008, , 255-278.		0

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109	ENGINEERING ARTIFICIAL STEM CELL NICHES. , 2010, , 285-309.		0
110	2.9 Materials as Artificial Stem Cell Microenvironments â˜†. , 2017, , 179-201.		0
111	Tissue Engineering: Morphogenesis Guided by 3D Patterning of Growth Factors in Biological Matrices (Adv. Mater. 25/2020). Advanced Materials, 2020, 32, 2070193.	11.1	0